

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-41. (Cancelled).

42. (Currently Amended) A system for heating a substance, the system comprising:

A. ~~—a vessel having enclosed comprising a side~~sidewall, a thermally conductive bottom end and a top end forming an opening for the introduction and extraction of ~~the~~a substance, the sidewall and the bottom end defining a chamber therein and the bottom end having comprising an external bottom side having comprising a central area for receiving heat; and

B. ~~—a series of~~ thermally conductive protrusions coupled to the vessel peripherally about the central area, ~~the protrusions and~~ extending from the vessel, ~~and defining with the central area a cavity; and~~

C. ~~—a heater comprising a heat source having a heat outlet configured to deliver heat to the cavity such that a heat transfer efficiency between a heater and the chamber is greater than~~fifty percent.

43. (Previously presented) The system of claim 42, further comprising a cover configured to close the opening.

44. (Previously presented) The system of claim 42, further comprising a thermal insulator configured to substantially encase the vessel.

45. (Currently amended) The system of claim 42, ~~including further comprising~~ a thermal insulator having a first portion configured to substantially encase the vessel and a second portion configured to substantially encase the protrusions.

46. (Currently amended) The system of claim 42, further comprising the heater, the heater comprising a burner~~wherein the heat outlet is a burner.~~

47. (Currently amended) The system of claim 46, wherein the burner is configured to burn a combustible fuel and the ~~heat source~~heater is configured to couple to a fuel source, the combustible fuel including one or more of butane, propane, kerosene, gasoline, jet fuel, diesel, alcohol, or white gas.

48. (Currently amended) The system of claim 42, wherein the protrusions ~~take the form of~~comprise a series of fins formed from a single piece of thermally conductive material.

49. (Currently amended) The system of claim 42, wherein the protrusions ~~take the form of a series of~~comprise pins.

50. (Currently amended) The system of claim 42, wherein the vessel ~~is~~comprises a multi-walled vessel having an inner vessel and an outer shell, the inner vessel configured to hold the substance in the chamber.

51. (Previously presented) The system of claim 42, wherein the protrusions are coupled to the vessel with a permanent couple.

52. (Previously presented) The system of claim 51, wherein the permanent couple is formed by brazing, soldering, welding, sonic welding, or gluing.

53. (Currently amended) The system of claim ~~42~~46, further comprising:

~~D.~~——a skirt configured to couple to the vessel, the skirt configured to substantially encase the protrusions and ~~having a series of~~comprising exhaust vents formed therein; and

~~E.~~——a base configured to couple to the skirt, the base configured to ~~substantially encase the heat source~~at least a portion of the heater, the base having a set of air inlet vents

formed therein, wherein a gas flow path is formed from the air inlet vents to the exhaust vents ~~via the heat outlet~~.

54. (Currently amended) The system of claim 53, wherein the base ~~is and heat source are~~ configured to removably couple to the skirt.

55. (Previously presented) The system of claim 53, wherein the base is configured to be stored within the vessel.

56. (Previously presented) The system of claim 53, wherein the skirt is integral with the vessel to form a single unit.

57. (Currently amended) The system of claim 53, further comprising:

F. —a baffle plate disposed below the ~~heat outlet~~burner and forming part of said gas flow path, the baffle plate ~~having~~comprising one or more air vents formed therein configured to deliver a predetermined amount of air received from the air inlet vents to the ~~heat outlet~~burner.

58. (Previously presented) The system of claim 53, wherein the skirt is integral with the base to form a single unit.

59. (Currently amended) The system of claim 42, wherein the protrusions comprise an undulating shape having a flat surface~~a series of undulations in at least one piece of thermally conductive material~~.

60. (Currently amended) The system of claim 59, wherein the protrusions comprise a single piece of material~~said undulations are comprised of a set of segments, with at least one segment thermally coupled to the vessel~~.

61. (Previously presented) The system of claim 42, wherein said protrusions have an aspect ratio of at least about 5.

62. (Previously presented) The system of claim 61, wherein said protrusions have an aspect ratio between about 10 and 20.

63. (Currently amended) The system of claim ~~42~~46, wherein said protrusions are substantially oriented to minimize radial obstruction of the flow of combustion gasses from the burner~~heat~~ ~~outlet~~.

64. (Currently amended) ~~The~~ system of claim ~~42~~59, wherein ~~said~~the protrusions are annularly arranged ~~in at least one ring disposed about the central area~~heat outlet.

65. (Canceled)

66. (Currently amended) The ~~high efficiency heat exchanger~~system of claim ~~65~~99, wherein the ~~protrusions~~member is ~~are configured to~~ permanently coupled to the vessel.

67. (Currently amended) The ~~high efficiency heat exchanger~~system of claim 66, wherein the permanent couple is formed by brazing, soldering, welding, sonic welding, or gluing.

68. (Currently amended) The ~~high efficiency heat exchanger~~system of claim ~~65~~99, wherein said ~~protrusions have~~member has an aspect ratio of at least about 5.

69. (Currently amended) The ~~high efficiency heat exchanger~~system of claim 68, wherein said ~~protrusions~~member havehas an aspect ratio between about 10 and 20.

70. (Currently amended) The ~~high efficiency heat exchanger~~system of claim ~~65~~99, wherein said ~~protrusions are~~member is substantially oriented to minimize radial obstruction of the flow of combustion gasses from a heater~~the heat outlet~~.

71. (Currently amended) The ~~high efficiency heat exchanger~~system of claim ~~65~~70, wherein said ~~protrusions are~~the member is annularly arranged ~~in at least one ring disposed about the heat outlet~~central area.

72. (Currently amended) The ~~high efficiency heat exchanger~~system of claim ~~65~~99, further comprising:

~~C.~~—a skirt configured to peripherally encase the ~~protrusions~~member, the skirt having a series of exhaust vents formed therein; and

~~D.~~—a base configured to ~~substantially~~ encase ~~theat least a portion of a heater~~heat source, the base having a set of air inlet vents formed therein, wherein a gas flow path is formed from the air inlet vents to the exhaust vents ~~via the heat outlet~~.

73. (Currently amended) The ~~high-efficiency heat exchanger~~system of claim 72, wherein the heater comprises a burner and the system further comprises~~ing~~:

~~E.~~—a baffle plate disposed below the ~~burner~~heat outlet and forming part of said gas flow path, the baffle plate ~~having~~comprising one or more air vents formed therein configured to deliver a predetermined amount of air received from the air inlet vents to the ~~burner~~heat outlet.

74. (Canceled)

75. (Canceled)

76. (Canceled)

77. (Canceled)

78. (Canceled)

79. (Canceled)

80. (Currently amended) The ~~heating vessel~~system of claim ~~79~~99, wherein the member comprises a single piece of material~~said undulations are comprised of a set of segments, with at least one segment thermally coupled to the vessel~~.

81. (Currently amended) The ~~heating vessel~~system of claim ~~74~~99, wherein ~~some of said protrusions~~the member radially extends beyond ~~said external~~the bottom surface~~end~~ and transverses portions of the sidewalls~~sides~~ of the vessel.

82. (Currently amended) The ~~heating vessel~~system of claim 81, wherein the vessel has a height of H and said portions of the vessel sidewall~~sides~~ traversed by said ~~protrusions~~member is less than about 1/4 of said vessel height H .

83. (Canceled)

84. (Canceled)

85. (Currently amended) The ~~heating vessel~~system of claim 7499, further comprising a removable handle assembly.

86. (Currently amended) A ~~The system for heating a substance~~of claim 50, wherein an outer surface of the sidewall of the inner vessel and an inner surface of the outer shell form an annular gap therebetween, further comprising,

- A. ~~an inner vessel designed to hold the substance, said inner vessel having an inner vessel interior surface and an inner vessel exterior surface, said inner vessel having an open top and extending downward from said open top to terminate in an inner vessel bottom;~~
- B. ~~a housing having a housing sidewall with a housing sidewall exterior surface and a housing sidewall interior surface, said housing sidewall terminating in a housing sidewall base region and a housing sidewall top region, said housing sidewall being configured such that said inner vessel, when positioned and affixed in said housing, provides an annular gap between said inner vessel exterior surface and said housing sidewall interior surface, said housing sidewall top region having exhaust vents therethrough communicating with said annular gap;~~

~~C. — a heater having a fuel supply system and burner head bounded by a peripheral border, said heater being mounted to said housing sidewall base region of said housing so as to position said burner head under said inner vessel bottom; and~~

~~D. — downwardly directed protrusions coupled to said inner vessel exterior surface, said protrusions extending beyond said inner vessel bottom and positioned such that said protrusions are arranged around said peripheral border of said burner head so as to provide a cavity which encompass said burner head so as to collect a substantial portion of the heat from the combustion by said burner head, as the heat passes through said protrusions into said annular gap.~~

87. (Canceled)

88. (Currently amended) The system of claim 86, wherein ~~a~~ said heater is made integral coupleable with said housing sidewall base region a base region of the outer shell, the base region formed where a sidewall of the outer shell terminates.

89. (Currently amended) The system of claim ~~86~~88, further comprising:

~~E. — a burner mounting coupling formed on said heater; and,~~

~~F. — an housing~~outer shell mounting coupling on ~~said sidewall~~the base region of the outer shell, said ~~housing~~outer shell mounting coupling being configured to attachably mate with said burner mounting coupling of said heater.

90. (Currently amended) The system of claim 86, further comprising:

a heater comprising a burner;

~~E. — a base configured to substantially encase the burner head, the base having a set of air inlet vents formed therein, wherein a gas flow path is formed from the air inlet vents to the exhaust vents~~ formed in a top region of the outer shell ~~via the burner head; and~~

F.——a baffle plate disposed below the burner-head and forming part of said gas flow path, the baffle plate having one or more air vents formed therein configured to deliver a predetermined amount of air received from the air inlet vents to the burner-head.

91. (Currently amended) The system of claim 86, wherein the protrusions are permanently coupled to the ~~outer~~inner vessel exterior surface of the sidewall of the inner vessel.

92. (Previously presented) The system of claim 91, wherein the permanent couple is formed by brazing, soldering, welding, sonic welding, or gluing.

93. (Canceled)

94. (Canceled)

95. (Canceled)

96. (Canceled)

97. (New) The system of claim 42, wherein the heat transfer efficiency is greater than seventy-five percent.

98. (New) The system of claim 42, wherein the heat transfer efficiency is greater than about ninety percent.

99. (New) A system for heating a substance, the system comprising:

a vessel comprising a sidewall and a bottom end, the sidewall and the bottom end defining a chamber therein; and

a thermally conductive member comprising an undulating shape having a flat surface coupled to the vessel peripherally about a central area of the bottom end.

100. (New) The system of claim 99, wherein the member comprises a regular undulating shape.

101. (New) The system of claim 99, further comprising a heater.

102. (New) The system of claim 99, wherein the member comprises a castellated shape.

103. (New) The system of claim 99, wherein the undulating shape forms a plurality of tapered passages therebetween.

104. (New) The system of claim 103, wherein the tapered passages expand outwardly.

105. (New) The system of claim 99, wherein the flat surface is coupled to the vessel.